1915MNRAS..76...36T

Measures of Double Stars—continued.

Σ.	R.A. 1900.	Decl. 1900.	Magnitudes.	Pos Ang.	Distance.	Epoch.	Nights.	Remarks.
	h m	° ′		°	″			
3031	23 36·0	+ 5 43	7·5, 8·5	312·0	14·30	1914·850	2	
3043	,, 47·8	38 8	8·4, 9·2	250·7	16·06	·862	2	Slow < D.
3044	,, 47·9	11 22	6·9, 7·3	282·05	19·18	·855	2	P. XXIII 216-7; slow < D; ylsh., blsh.
3052	,, 57·8	70 48	7·2, 7·8	7·4	34·48	·862	2	Slow < D.
3053	,, 57·5	65 33	6·0, 7·3	71·5	15·30	·862	2	A <; yel., bl.
3054	23 57·9	+ 7 43	7·5, 8·5	180·9	33·73	1914·855	2	

Mr. Frederick J. Hanbury's Observatory,
Brockhurst, East Grinstead.

Measures of Southern Binary Stars. By John Tebbutt.

The following are the results of measures of α Centauri and γ Coronæ Australis with the Grubb 8-inch equatorial and Cooke filar-micrometer.

Star.	Date.	Position Angle.	Distance.	No. of Evenings.
		°	″	
α Centauri	1913·457	217·0	18·41	10
γ Coronæ Aust.	1913·646	100·2	2·28	5
α Centauri	1915·415	219·1	17·66	10

The final results are derived by weighting the results for each evening according to the number of measures and the conditions for observing. The measures of α Centauri were taken in full sunlight, and those of γ Coronæ Australis in twilight. In consequence of a considerable failure of my eyesight since 1913, I regard the measures of 1915, particularly those of distance, as not so satisfactory as the results of 1913.

Observatory, Peninsula, Windsor,
N.S. Wales:
1915 *October* 2.

Downloaded from http://mnras.oxfordjournals.org/ at New York University on June 21, 2015

© Royal Astronomical Society • Provided by the NASA Astrophysics Data System

1915MNRAS..76...36T

The Dynamics of a Stellar System. Third Paper: Oblate and other Distributions. By A. S. Eddington, M.A., M.Sc., F.R.S., Plumian Professor.

1. In a former paper * I have treated of a stellar system, having spherical symmetry, in a steady state of motion, and with a distribution of velocities according to Schwarzschild's ellipsoidal law. An exact solution of this problem was obtained, so that it was possible to specify the density and law of velocities at all parts of a system of this kind. In the present paper the restriction of spherical symmetry is removed, and the investigation is extended to oblate and other systems.

In the previous work the system was supposed to move under forces arising solely from its own attraction; but we shall now find it useful to keep distinct those results which are true when the system moves under any conservative system of forces, and the additional limitations imposed when those forces are identified with its own gravitational attractions. It is possible that the latter are not the only forces concerned; for example, L. V. King † has pointed out that H. S. Jones's value of the absorption of light leads to the conclusion that the quantity of residual gas in interstellar space is such as to produce a gravitational field very much greater than that of the whole system of lucid stars. Further, by postponing the assumption that there are no other forces, we can obtain results applicable to part of the system only, *e.g.* the stars of one particular mass; in this way we can better take into account the heterogeneity of the actual stellar system. Thus, except where expressly stated, we shall not introduce the limitation that the attraction of the system is the sole force concerned; and it will be seen that results of wide generality are obtained, which may be regarded as purely kinematical consequences of the ellipsoidal law of velocities.

The objects of the investigation are twofold :—

(1) We must determine the velocity-law at all parts of the system. It is *assumed* that in any small region the frequency of a velocity (u, v, w) is proportional to $e^{-a^2u^2-b^2v^2-c^2w^2}$ conformably to the ellipsoidal law, where the exponent defines an ellipsoid known as the velocity-ellipsoid; but the velocity-ellipsoid will in general vary in size, shape, and orientation from one part of the system to another, and we wish to determine these variations. The problem is to fit together velocity-ellipsoids varying from point to point of space in such a way as to give a steady state of motion.

(2) We must also determine the density, or number of stars per unit volume, at all parts of the system.

From the various possible solutions we have then to pick out

---

* The Second Paper, *M.N.*, vol. lxxv. p. 366.

† *Nature*, vol. xcv. p. 701.

Downloaded from http://mnras.oxfordjournals.org/ at New York University on June 21, 2015

© Royal Astronomical Society • Provided by the NASA Astrophysics Data System